

1. Rejection of Claims 21-40 Under 35 U.S.C. §103(a)

The Office Action states,

Claims 21-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bohnen et al. (WO 99/40129, its family US 6,482,902 is cited hereinafter as '902 for convenience) in view of Bohnen et al. (WO 99/06414, its family US 6,417,302 is cited hereinafter as '302 for convenience).

'902 discloses a process of preparation of a catalyst solid, wherein the catalyst composition is substantially the same as the instant claims when one considers that the combination of the organometallic compound represented by formula (V) of component (B) and the active hydrogen-containing organic compound represented by formula (VI) of component (C) on the instant claims corresponds to component (d) of '902 of col. 2, lines 35-54 and Examples 1-4 of '902 (col. 2, line 14 to col. 3, line 16; col. 3, line 41 to col. 5, line 31; and Examples 1-4, 6, 8, 11, 13, and 17-25). It is noted that '902 does not expressly disclose of combining all of the catalyst components without any isolation of an intermediate. However, '302 teaches a similar catalyst composition by combining all of the catalyst components to provide a catalyst solid without any isolation of the intermediate, a 'one-pot' synthesis (Examples 1-7, col. 1, line 1 to col. 6, line 49).

Thus, it would have obvious to one of ordinary skill in the art to employ the one pot synthesis process of '302 to prepare the catalyst solid of '902 with a reasonable expectation of obtaining a highly useful method of making a supported catalyst with the benefit of fewer steps and thus lower cost of the production and in the absence of any showing of criticality and unexpected results.

RESPONSE

Applicant respectfully traverses the rejection of claims 21-40.

The U.S. Supreme Court in *Graham v. John Deere Co.*, 148 U.S.P.Q. 459 (1966) held that non-obviousness was determined under §103 by (1) determining the scope and content of the prior art; (2) ascertaining the differences between the prior art and the claims at

issue; (3) resolving the level of ordinary skill in the art; and, (4) inquiring as to any objective evidence of non-obviousness.

Accordingly, for the Examiner to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. See MPEP §2142.

Further, the Examiner needs to show basis for combining the references to properly set forth a *prima facie* case of obviousness. The combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a *prima facie* case of obvious was held improper; In re Rouffet, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998).

Arguments in Applicant's previous responses of February 19, 2008, August 3, 2007, and November 30, 2006 are incorporated herein by reference in their entirety.

As outlined in Applicant's previous response of February 19, 2008, Applicant respectfully notes the Examiner concedes on page 2, lines 13-15, of the currently pending Office Action,

It is noted that '902 does not expressly disclose of

combining all of the catalyst components without any isolation of an intermediate.

To fill this acknowledged gap, the Examiner then asserts on page 2, lines 15-22,

However, '302 teaches a similar catalyst composition by combining all of the catalyst components to provide a catalyst solid without any isolation of the intermediate, a 'one-pot' synthesis (Examples 1-7, col. 1, line 1 to col. 6, line 49).

Thus, it would have obvious to one of ordinary skill in the art to employ the one pot synthesis process of '302 to prepare the catalyst solid of '902 with a reasonable expectation of obtaining a highly useful method of making a supported catalyst with the benefit of fewer steps and thus lower cost of the production and in the absence of any showing of criticality and unexpected results.

However, as previously outlined in Applicant's aforementioned response, Applicant respectfully traverses the Examiner's reasoning for the current rejection. In particular, Applicant respectfully believes the Examiner has not used the appropriate standard for establishing a *prima facie* case of obviousness.

First and foremost, Applicant respectfully believes the Examiner has not explained, absent Applicant's specification and currently pending claims, why one of ordinary skill in the art would have deviated from the express disclosure of WO 99/40129 (herein referred to as "Bohnen, et al. I"), and modified Bohnen, et al. I as suggested by the Examiner. In fact, Bohnen, et al. I discloses in col. 27, lines 24-56, in particular, col. 27, lines 51-54, of U.S. Patent 6,482,902, which is a U.S. patent issued from the

International Application published as WO 99/40129, and which is relied upon herein solely for translation purposes,

The modified support material **is then dried** in a high vacuum. **After drying**, the modified support material can be resuspended and after-treated with a compound of the formula (V). (Emphasis added)

Bohnen, et al. I then additionally discloses in col. 27, lines 56-64,

The application of one or more metallocene compounds, preferably of the formula (VI), and one or more organometallic compounds of the formula (V) to the modified support material is preferably carried out by dissolving or suspending one or more metallocene compounds of the formula (VI) in an above-described solvent and subsequently reacting it/them with one or more compounds of the formula (V), which is/are preferably likewise dissolved or suspended.

Accordingly, Bohnen, et al. I clearly and expressly discloses the modified support material comprising the components of formula (I) and (II), and optionally the components of formula (V), are prepared and **then dried before** the metallocene compound(s) is/are added, whereas Applicant is currently claiming a process for preparing a catalyst solid by contacting, without any isolation of an intermediate, (A) at least one organic transition metal compound; (B) at least one organometallic compound of formula (V); (C) at least one organic compound comprising at least one functional group comprising active hydrogen; (D) at least one Lewis base; and (E) at least one support. In other words, Bohnen, et al. I clearly discloses a process comprising: (i) first contacting the components

of formula (I) and (II), and optionally the components of formula (V); (ii) drying the resultant modified support material, and **then after drying**; (iii) contacting the modified support material with a metallocene compound. Alternatively, Applicant is currently claiming a process comprising contacting components (A), (B), (C), (D), and (E), **without isolating any intermediate**. Therefore, Applicant respectfully believes Bohnen, et al. I clearly teaches away from Applicant's currently claimed process. See MPEP §2141.02 VI. In light of the above, for this reason alone, Applicant respectfully believes Bohnen, et al. I should be removed from the instant rejection, and the current rejection be withdrawn.

Notwithstanding the above, Applicant also respectfully believes the Examiner has not explained why one would have deviated from the express disclosure of Bohnen, et al. I, nor has the Examiner explained why one would have expected such a modification would have been successful, absent the teaching in Applicant's specification for the current application. In fact, the only basis the Examiner offers for modifying Bohnen, et al. I is that,

Thus, it would have obvious to one of ordinary skill in the art to employ the one pot synthesis process of '302 to prepare the catalyst solid of '902 with a reasonable expectation of obtaining a highly useful method of making a supported catalyst with the benefit of fewer steps and thus lower cost of the production and in the absence of any showing of criticality and unexpected results.

However, as outlined *supra*, Bohnen, et al. I clearly teaches away from the Examiner's proposed modification insomuch that Bohnen,

et al. I clearly states the modified support material comprising components of formula (I) and (II), and optionally components of formula (V), are prepared and dried **before** the metallocene compound(s) is/are added. See col. 27, lines 24-56, in particular, col. 27, lines 51-54, as well as col. 27, lines 56-64 in Bohnen, et al. I. Accordingly, Applicant respectfully believes the current rejection by the Examiner is improper, as should be withdrawn. See MPEP §2141.02 VI.

Furthermore, as outlined *supra*, the Examiner has acknowledged on page 2, lines 13-15, of the currently pending Office Action Bohnen, et al. I does not disclose Applicant's currently claimed process comprising contacting components (A), (B), (C), (D), and (E), without isolating any intermediate. However, the Examiner tries to straddle this factual deficiency by stating on page 2, lines 15-22, of the currently pending Office Action,

However, '302 teaches a similar catalyst composition by combining all of the catalyst components to provide a catalyst solid without any isolation of the intermediate, a 'one-pot' synthesis (Examples 1-7, col. 1, line 1 to col. 6, line 49).

Thus, it would have obvious to one of ordinary skill in the art to employ the one pot synthesis process of '302 to prepare the catalyst solid of '902 with a reasonable expectation of obtaining a highly useful method of making a supported catalyst with the benefit of fewer steps and thus lower cost of the production and in the absence of any showing of criticality and unexpected results.

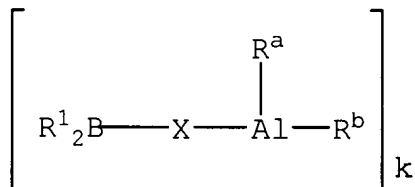
However, Applicant respectfully traverses the Examiner's contention that WO 99/06414, (herein referred to as "Bohnen, et al.

II"), "teaches a similar catalyst composition by combining all of the catalyst components to provide a catalyst solid without any isolation of the intermediate." In fact, Bohnen, et al. II discloses in col. 1, lines 1-7, and col. 1, line 48 - col. 2, line 24 of U.S. Patent 6,417,302, which is a patent issued from the International Application published as WO 99/06414, and which is relied upon herein solely for translation purposes,

The present invention relates to a chemical compound which, in combination with a metallocene, can form a catalyst system which can advantageously be employed for the polymerization of olefins.

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The object is achieved by a chemical compound of the formula A



in which R^1 are identical or different and are a hydrogen atom, a halogen atom, a boron-free C_1 - C_{40} -hydrocarbon-containing group, such as C_1 - C_{20} -alkyl, C_1 - C_{20} -haloalkyl, C_1 - C_{10} -alkoxy, C_6 - C_{20} -aryl, C_6 - C_{20} -haloaryl, C_6 - C_{20} -aryloxy, C_7 - C_{40} -arylalkyl, C_7 - C_{40} -haloarylalkyl, C_7 - C_{40} -alkylaryl or C_7 - C_{40} -haloalkylaryl, or R^1 can be an OSiR^3_3 group, in which R^3 are identical or different and are a hydrogen atom, a halogen atom, a C_1 - C_{40} -hydrocarbon-containing group, such as C_1 - C_{20} -alkyl, C_1 - C_{20} -haloalkyl, C_1 - C_{10} -alkoxy, C_6 - C_{20} -aryl, C_6 - C_{20} -haloaryl, C_6 - C_{20} -aryloxy, C_7 - C_{40} -arylalkyl, C_7 - C_{40} -haloarylalkyl, C_7 - C_{40} -alkylaryl or C_7 - C_{40} -haloalkylaryl, or R^1 can be a $\text{CH}(\text{SiR}^4_3)_2$ group in which R^4 may be identical or different and are a hydrogen atom, a halogen atom, a C_1 - C_{40} -hydrocarbon-containing group, such as C_1 - C_{20} -alkyl, C_1 - C_{20} -haloalkyl, C_1 - C_{10} -alkoxy, C_6 - C_{20} -aryl, C_6 - C_{20} -haloaryl, C_6 - C_{20} -aryloxy, C_7 - C_{40} -arylalkyl, C_7 - C_{40} -haloarylalkyl, C_7 - C_{40} -alkylaryl or C_7 - C_{40} -haloalkylaryl,

X is identical or different and is an element from group VIA of the Periodic Table of the Elements or is an NR group, where R is hydrogen or a C₁-C₂₀-hydrocarbon radical, such as C₁-C₂₀-alkyl or C₁-C₂₀-aryl,

R^a and R^b may be identical or different and are a hydrogen atom, a halogen atom, a boron-free C₁-C₄₀-hydrocarbon-containing group, such as C₁-C₂₀-alkyl, C₁-C₂₀-haloalkyl, C₁-C₁₀-alkoxy, C₆-C₂₀-aryl, C₆-C₂₀-haloaryl, C₆-C₂₀-aryloxy, C₇-C₄₀-arylalkyl, C₇-C₄₀-haloarylalkyl, C₇-C₄₀-alkylaryl or C₇-C₄₀-haloalkylaryl, or R¹ can be an OSiR³₃ group, in which R³ are identical or different and are a hydrogen atom, a halogen atom, a C₁-C₄₀-hydrocarbon-containing group, such as C₁-C₂₀-alkyl, C₁-C₂₀-haloalkyl, C₁-C₁₀-alkoxy, C₆-C₂₀-aryl, C₆-C₂₀-haloaryl, C₆-C₂₀-aryloxy, C₇-C₄₀-arylalkyl, C₇-C₄₀-haloarylalkyl, C₇-C₄₀-alkylaryl or C₇-C₄₀-haloalkylaryl[,].

Accordingly, Applicant respectfully believes Bohnen, et al. II relates to compounds containing boron and aluminum, and does not disclose "a similar catalyst composition" to that of Applicant's, as purported by the Examiner. In fact, Applicant respectfully believes the specific compounds containing boron and aluminum which are disclosed in Bohnen, et al. II is what one of ordinary skill in the art would have focused on, if anything. As is well settled, "motivation is not abstract, but practical, and always related to the properties or uses one skilled in the art would expect the compound [or process] to have, if made." See *In re Gyurik*, 201 USPQ 552, 557 (CCPA 1979); and see also *In re Lalu*, 223 USPQ 1257, 1259 (Fed. Cir. 1984); and *In re Newell*, 13 USPQ2d 1248, 1250 (Fed. Cir. 1989). Additionally, change for the sake of change is not what one of ordinary skill in the art seeks to do. "One of ordinary skill in the art follows conventional wisdom and does not innovate." *Standard*

Oil Co. v. American Cyanamid Co., 227 USPQ 293, 297-98 (Fed. Cir. 1985). Indeed, Applicant respectfully believes proceeding with the catalyst system disclosed in Bohnen, et al. I, rather than the critical compounds containing boron and aluminum disclosed in Bohnen, et al. II, would be a modification which would defeat the purpose of the process disclosed in Bohnen, et al. II. Accordingly, this is the antithesis of obviousness. *Ex parte Dussaud*, 7 USPQ2d 1818, 1820 (BPAI 1988); *Ex parte Hartmann*, 186 USPQ 366, 367 (Bd. App. 1974); *In re Gordon*, 221 USPQ 1125, 1127 (Fed. Cir. 1984); *In re Fritch*, 23 USPQ2d 1780, 1783 n. 12 (Fed. Cir. 1992); *In re Schulpen*, 157 USPQ 52, 55 (CCPA 1968); and *In re Spinnoble*, 160 USPQ 237, 244 (CCPA 1969).

Additionally, Applicant respectfully believes there is no mention in either Bohnen, et al. I, or Bohnen, et al. II that any benefit may be achieved by proceeding in a contrary fashion to the express disclosure of either document. In fact, Applicant respectfully believes there is not even a hint of a suggestion for why one of ordinary skill in the art would have deviated from the disclosure of Bohnen, et al. I on the one hand, or from the disclosure of Bohnen, et al. II on the other hand. Moreover, and most importantly, Applicant believes there is no suggestion in the combined references to have proceeded as asserted by the Examiner, and as currently claimed. In fact, Applicant respectfully believes Bohnen, et al. I and Bohnen, et al. II only disclose not to deviate from their express disclosures.

Notwithstanding all of the arguments above, Applicant respectfully believes Bohnen, et al. II fails to disclose, teach, or suggest Applicant's currently claimed process comprising contacting, without isolation of an intermediate, components (A)-(E), and in particular, **at least one Lewis base (i.e., component (D))**, as currently claimed by Applicant. In fact, the Examiner even acknowledges this fact in the instant Office Action on page 3, lines 13-20,

Secondly, comparing the claimed catalyst preparation process and the catalyst preparation process of Bohnen '302 of combining all of the catalyst components to provide a catalyst solid without any isolation of the intermediate, a 'one-pot' synthesis, the only missing catalyst component in Bohnen '302 is the Lewis base such as N,N-dimethylaniline. Since the Lewis base such as N,N-dimethylaniline is not expected to interfere the formation of the catalyst in view of the disclosure of Bohnen '902, one would have expected the one pot synthesis process to be successful for the preparation of the catalyst composition of Bohnen '902.

However, Applicant respectfully traverses the Examiner's reasoning. In particular, the Examiner seems to be equating whether or not at least one Lewis base would "interfere" with the formation of the catalyst system disclosed in Bohnen, et al. II with obviousness. However, even if the Examiner's contention is to be adopted for arguments sake, which Applicant neither agrees with nor denies, the mere fact that at least one Lewis base, such as N,N-dimethylaniline, may not interfere with the formation of the catalyst system of Bohnen, et al. II does not satisfy the Examiner's burden to establish a *prima facie* case of obviousness. See MPEP

§2141 and §2142. In fact, the question to be asked, answered, and supported by Examiner is *why*, absent Applicant's express disclosure to do so, one would have modified Bohnen, et al. II to include at least one Lewis base as currently claimed by Applicant? However, the Examiner has not addressed this issue, nor has the Examiner provided a reasonable explanation as to *why* one having ordinary skill in the art would have modified the process of Bohnen, et al. II, as purported by the Examiner, in the absence of Applicant's express disclosure. This, however, is the Examiner's initial burden to establish a *prima facie* case of obviousness. *Id.* §2141 and §2142.

Accordingly, Applicant respectfully believes the current rejection should be withdrawn.

Notwithstanding the arguments *supra*, Applicant has unexpectedly found the currently claimed process enables one to prepare catalyst solids having a good polymerization activity while using a reduced amount of expensive boron-containing compounds or transition metal-containing compounds, as well as enables one to prepare catalyst solids having an increased polymerization activity. Examples 2 and 6, as well as Comparative Example B in Applicant's specification are provided below in Table 1.

Table 1:

	Productivity (kg of PP/g catalyst solid*h)	Productivity (kg of PP/mol of B*h)	Productivity (kg of PP/mmol of Zr*h)
Example 2	1.8	2.4	158
Example 6	0.7	0.6	40
Comparative Example B	0.6	0.56	25.5

As outlined above in Table 1, Applicant has unexpectedly found the currently claimed process not only increases productivity with respect to grams of catalyst solid used and moles of boron used, but also dramatically increases the productivity with respect to the mmol of transition metal used. In fact, Examples 2 and 6 comprise productivities, with respect to mmol of transition metal used, of **619.6% and 63.75% greater** than Comparative Example B.

In light of the arguments and evidence provided above, Applicant kindly requests the Examiner to withdrawal the instant rejection.

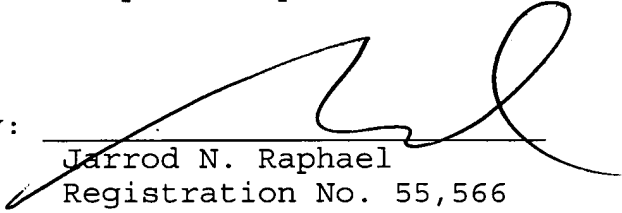
CONCLUSION

Based upon the above remarks, the presently claimed subject matter is believed to be novel and patentably distinguishable over the references of record. The Examiner is therefore respectfully requested to reconsider and withdraw the currently pending rejection, and allow claims 21-40. Favorable action with an early allowance of the claims pending in this application is earnestly solicited.

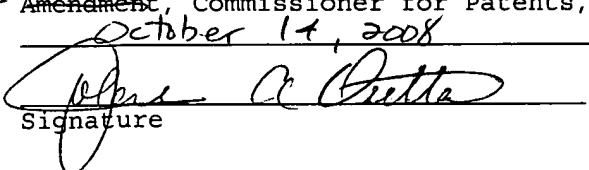
The Examiner is welcomed to telephone the undersigned practitioner if she has any questions or comments.

Respectfully submitted,

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October 14 2008
Date